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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

OSELE, MARK A

ART UNIT

PAPER NUMBER

1734

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/030,272	<b>Applicant(s)</b> RAYSSAC ET AL.	
	<b>Examiner</b> Mark A Osele	<b>Art Unit</b> 1734	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☐ Responsive to communication(s) filed on \_\_\_\_.

2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) 30-58 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.

5) ☐ Claim(s) \_\_\_\_ is/are allowed.

6) ☒ Claim(s) 31-39 and 42-58 is/are rejected.

7) ☒ Claim(s) 40 and 41 is/are objected to.

8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 08 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☒ All   b) ☐ Some \*   c) ☐ None of:

- 1. ☐ Certified copies of the priority documents have been received.
- 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
- 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) Paper No(s). <u>5</u> .
2) <input type="checkbox"/> Notice of Draftsperson's Patent Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.	6) <input type="checkbox"/> Other:

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 30-31, 34, 36-38, 52, 55 and 57 are rejected under 35 U.S.C. 102(b) as being anticipated by Chuss et al. (U.S. 4,071,944) Chuss et al. shows a method and apparatus for separating two bonded elements, 20, 14, comprising: before adhering the two elements creating a cavity, 16, in at least one cavity one of the elements, 14, emerging at the interface to enable separation means into their interface; exerting a force in a localized manner at the interface by application of the separation means to

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initiate separation of the elements at the interface and continuing separation until the elements are completely separated (column 3, lines 47-54).

Regarding claim 34, the separation means dissolves the adhesive.

Regarding claims 36-38, the cavities are made at the periphery of the element and extend from side to side through the inner region.

3. Claims 30-32, 37, 39, 52-54, are rejected under 35 U.S.C. 102(b) as being anticipated by Comet (U.S. 3,190,785). Comet shows a method and apparatus for separating two bonded elements, 12, 14, comprising: before adhering the two elements creating a cavity, 13, in at least one cavity emerging at the interface to enable separation means, 17, into their interface; exerting a force in a localized manner at the interface by application of the separation means to initiate separation of the elements at the interface and continuing separation until the elements are completely separated (Figs. 1, 2).

Regarding claim 32, Comet shows the separation means contains means, 17, for exerting a mechanical action at the interface.

Regarding claims 37 and 39, Comet shows a plurality of cavities in the inner region of one of the elements.

4. Claims 30-32 and 37, are rejected under 35 U.S.C. 102(b) as being anticipated by Buchaklian, Jr. (U.S. 3,547,744). Buchaklian, Jr. shows a method and apparatus for separating two bonded elements at their interface comprising: before adhering the

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two elements, 39, 33, creating a cavity, 35, in at least one of the elements, 33, emerging at the interface to enable separation means, 25, into the cavity; exerting a force in a localized manner at the interface by application of the separation means to initiate separation of the elements at the interface and continuing separation until the elements are completely separated (Fig 5).

Regarding claim 32 Buchaklian, Jr. shows means, 25, for exerting a mechanical action.

5. Claims 30-31, 33, 37, 52-53, 55 and 57 are rejected under 35 U.S.C. 102(b) as being anticipated by Beltz et al. (U.S. 4,466,852). Beltz et al. shows a method and apparatus for separating two bonded elements, 71, 12, comprising: before adhering the two elements creating a cavity, 90, in at least one of the elements, 71, emerging at the interface to enable separation means into their interface; exerting a fluid pressure force in a localized manner at the interface by application of the separation means to initiate separation of the elements at the interface and continuing separation until the elements are completely separated (column 6, lines 18-36).

6. Claims 30-32, 36, 52-54, are rejected under 35 U.S.C. 102(b) as being anticipated by Fujimoto et al. (U.S. 5,897,743). Fujimoto et al. shows a method and apparatus for separating two bonded elements, 3, 4, comprising: before adhering the two elements creating a cavity, 3a, 4a, in at least one cavity emerging at the interface to enable separation means, 1a, into their interface; exerting a force in a localized manner

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at the interface by application of the separation means to initiate separation of the elements at the interface and continuing separation until the elements are completely separated (column 2, line 47 to column 3, line 18).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chuss et al. Although Chuss et al. fails to disclose how the channels were made in the first element, engraving is a conventional method for forming channels and markings in metal plates. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the conventional method of engraving to place the channels in the element of Chuss et al.

9. Claims 30, 31, 33, 36, 42-47, 52, and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henley et al. (U.S. 5,985,742) in view of Iwane et al. (U.S. 6,140,209). Henley et al. teaches the method and apparatus for separating two bonded elements (substrate 10 and target substrate, not shown, see column 3, lines 51-57), at an embrittled interface by placing the laminate in an enclosure with a high pressure chamber and a low pressure chamber such that fluid force in the high pressure chamber

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is directed at the embrittled interface to create a controlled cleaving process (column 7, lines 10-65). Henley et al. fails to show creation of a cavity in at least one of the bonded elements prior to bonding.

Iwane et al. teaches that a substrate with an embrittled interface and a target substrate are imparted with cavities in the form of chamfers prior to bonding and these cavities allow for the application of separation means to the bonded interface (column 5, lines 21-44). It would have been obvious to one of ordinary skill in the art at the time of the invention to add the chamfers of Iwane et al. into the method and apparatus of Henley et al. because these are conventional elements of semiconductor wafers created during routine processing.

10. Claims 48-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henley et al. in view of Iwane et al. as applied to claim 47 above, and further in view of Yanagita et al (U.S. 6,418,999). Yanagita et al. teaches that excessive warp and breakage during separation can be prevented by using support surfaces which limit the warp (Figs. 30, 31; column 23, line 64 to column 24, line 25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a stop to prevent excessive warp as taught by Yanagita et al.

Regarding claims 49 and 51, Henley et al. shows a joint between the end of the wafer and the wall of the structure.

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Regarding claim 50, Yanagita et al. also shows advantages of joints between a main face of the elements and the walls of the enclosure (Figs. 38, 39; column 25, lines 42-52).

11. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chuss et al. in view of Bull. Chuss et al. fails to show the channels to be in concentric circles. Bull teaches that chucks for holding wafers during sawing can have channels in concentric circles. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the channel configuration of Bull in the apparatus of Chuss et al. because Bull shows this configuration to be functionally equivalent to the grid pattern of Chuss et al.

***Allowable Subject Matter***

12. Claims 40 and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. The following is a statement of reasons for the indication of allowable subject matter: None of the prior art suggests microwave excitation of the liquid used as separating means or the two elements bonded with different adherence energies in different regions.



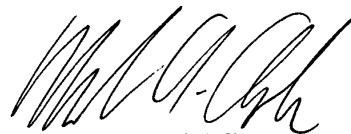
***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hanks et al. and Conant et al. each show separating elements wherein cavities are formed in one of the elements prior to bonding and a force is applied therethrough.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark A Osele whose telephone number is 703-308-2063. The examiner can normally be reached on Mon-Fri 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 703-308-3853. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



**MARK A. OSELE  
PRIMARY EXAMINER**

June 27, 2003